84099

Work Order ID 85390

June-07-12 9:26:18 AM

85390

Item ID: D412-664-203TRN
Revision ID:
Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 **Start Qty:** 1.00 *1*
Required Date: 21/06/2012 **Req'd Qty:** 1.00 *1*
Reference:

Accept *N900040100*

Setup Start *NS1*
Stop *NS2*

Cust Item ID:
Customer:

Approvals: **Process Plan:** MCJ **Date:** 12/06/07 **Tooling:** **Date:**
QC: **Date:** **SPC (Y/N):** **Date:**

Run Start *NR1*
Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	**Revision Nbr**								
D412-664-243	Rev E(DEO)								
100		0.00							
100	MORI SEIKI CNC LATHE LARGE					1	Ø		
Mori Seiki	**Memo**	0.00							
Mori Seiki CNC Lathe Large	1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166 2-Turn first side as per Folio-FA166 3- File transition lines smooth. FOLIO REV: A DWG REV: E								MAL 12/06/16
110	QC1- Inspect dimensions to dimension sheet	0.00							
110						1	Ø		
QC	**Memo**	0.00							
Quality Control									MAL 12/06/16

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 85390

June-07-12 9:26:18 AM

85390

Item ID: D412-664-203TRN **Accept** *N900040100* **Setup Start** *NS1*

Revision ID: **Stop** *NS2*

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 **Start Qty:** 1.00 *1*

Required Date: 21/06/2012 **Req'd Qty:** 1.00 *1*

Reference:

Cust Item ID:

Customer:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120		0.00							
120	MORI SEIKI CNC LATHE LARGE					1	0		
Mori Seiki	**Memo**	0.00							
Mori Seiki CNC Lathe Large	1-Turn second side as per Folio FA166 2- File transition lines smooth. 3- Remove sand and plugs 4-Scribe part # and batch # using vibrating stilus FOLIO REV: A DWG REV: E								12/06/18
130	QC1- Inspect dimensions to dimension sheet	0.00							
130	+ Perform ultrasonic measurements					1	0		
QC	**Memo**	0.00							
Quality Control						RTO			12/06/18
140	QC8- Inspect parts - second check	0.00							
140	+ check ultrasonic measurements								12-6-18
QC	**Memo**	0.00							
Quality Control	and orientation after Bending								

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: [illegible] Date: 12/06/28

QA Closed: CK Date: 12/6/29

Work Order: 85390

Part No. D412-664-203.TRN

NCR No. 12-1542

DISPOSITION

Rework	☐
Scrap	☐
Use-as-is	☑
Work Order Update	☐

AGAINST DEPARTMENT/PROCESS

Skid-tube	☐	Crosstube	☑	Prod. Eng. Coor.	☐	Engineering	☐
Machining	☐	Small Fab	☐	Rec/Store/Packaging	☐	Quality	☐
Thermoforming	☐	Finishing	☐	Supplier	☐		
Large Fab	☐	Composite	☐	Other	☐		

Root Cause		Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data	☒	12/06/22	130	1	PART WAS INSPECTED PER QSI-038 BUT WAS UNABLE TO READ DIMENSION REQUIRED ON INSPECTION SHEET FOR READING 4 ON FAI INSPECTION SHEET. POSSIBLE DIMENSIONS ARE PART OF RECEIVING REPORT	GP 12/6/27 QSI 0038	Acceptable. READING 4 IS ON RAW MATL & RAW MATL IS GOOD	GP 12/6/27	12-6-18	12/06/27
Equip/Tooling	☐									
Operator	☐									
Material	☐									
Offset/Setup	☐									
Other	☐									
Process	☐									
Supplier	☐									
Training	☑									
Unauthorized	☐									

DLL 12-15-18

FAULT CATEGORY

Landing Gear

- ☐ Bending Passes Below Min
- ☐ Centre Not Concentric to O/S
- ☐ Cracks
- ☐ Crushed/Crimp at Bending
- ☐ Inspection Strip in Tube
- ☐ Other
- ☐ Positioned Wrong
- ☐ Ripples on Inner Bend
- ☐ Torque Waves in Extrusion
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

Hardware

- ☐ Breaking
- ☐ Missing
- ☐ Size/Length
- ☐ Spinning
- ☐ Threading
- ☐ Wrong

Drill Holes

- ☐ Misaligned
- ☐ Ovalized
- ☐ Over/Undersized
- ☐ Too Many

General

- ☐ Burrs
- ☐ Contamination
- ☐ Cut Too Short
- ☐ Documentation/Data
- ☐ Finish
- ☒ Inspection Incomplete
- ☐ Inspection Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Jigs/Fixtures/Tooling
- ☐ Kit Incorrect
- ☐ Kit Missing
- ☐ Maintenance
- ☐ Mislabeled
- ☐ Off-Set
- ☐ Orientation Misread
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Lost
- ☐ Part Moved
- ☐ Raw Material
- ☐ Set-up
- ☐ Supplier
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other

Work Order ID 85390

June-07-12 9:26:18 AM

85390

Item ID: D412-664-203TRN **Accept** *N900040100* **Setup Start** *NS1*

Revision ID: **Stop** *NS2*

Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 **Start Qty:** 1.00 *1*

Required Date: 21/06/2012 **Req'd Qty:** 1.00 *1*

Reference:

Cust Item ID:

Customer:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____ **Run Start** *NR1*

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____ **Stop** *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
145		0.00							
145									
Crosstubes	**Memo**	0.00							
Crosstubes	GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.								
150	Crosstubes Chemical Conversion	0.00							
150									
HandFXtube	**Memo**	0.00							
Hand Finishing Crosstubes									
160	QC7-Inspect Chemical Conversion Coat	0.00							
160									
QC	**Memo**	0.00							
Quality Control									

AW 12-6-19

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Work Order ID 85390

June-07-12 9:26:18 AM

85390

Item ID: D412-664-203TRN
Revision ID:
Item Name: Crosstube Turning Detail
Start Date: 07/06/2012 **Start Qty:** 1.00 *1*
Required Date: 21/06/2012 **Req'd Qty:** 1.00 *1*
Reference:

Accept *N900040100*

Setup Start *NS1*
Stop *NS2*

Cust Item ID:
Customer:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Run Start *NR1*
Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170	Packaging	0.00							
170									
Packaging	**Memo**	0.00							
Packaging	Identify and stock in kanban rack Location: L-G								
180	QC21- Final Inspection - Work Order Release	0.00							
180									
QC	**Memo**	0.00							
Quality Control									

Rm 12-6-20

12/6/20 ~~12/6/20~~

MF 12-06-20

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

June-07-12 9:26:22 AM

Work Order ID: 85390

85390

Parent Item: D412-664-203TRN

D412-664-203TRN

Parent Item Name: Crosstube Turning Detail

Start Date: 07/06/2012 **Required Date:** 21/06/2012

Start Qty: 1.00 **Required Qty:** 1.00

Comments: IPP Rev:A 08-03-06 new issue DD verified by:eec
IPP Rev B 08.04.02 Removed polish EC verified by: DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6009-129		Manufactured	No			120	Each	23.0000	1	1			
D6009-129									**				
Crosstube Material													

Location	Loc Qty	Loc Code
LG	23	
69801	23	

mml
12/06/16

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	85391
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 **Rev:** E		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

[X] First Article [ ] Prototype

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.684	+0.005/-0.000	2.685	✓		vern	CWC-08
	2.748	+0.005/-0.000	2.749	✓		↓	
	2.884	+0.005/-0.000	2.888	✓			
	3.019	+0.005/-0.000	3.022	✓			
	3.163	+0.005/-0.000	3.163	✓			
	3.308	+0.005/-0.000	3.311	✓			
	3.429	+0.005/-0.000	3.429	✓			
	2.990	+0.005/-0.000	2.990	✓			
	2.618	+0.005/-0.000	2.621	✓		↓	
	0.200	+/-0.010	.200	✓		vern	CWC-08
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		"	
	4.971	+/-0.030	4.971	✓		vern	CWC-08
SIDE B	2.684	+0.005/-0.000	2.688	✓		vern	CWC-08
	2.748	+0.005/-0.000	2.751	✓		↓	
	2.884	+0.005/-0.000	2.889	✓			
	3.019	+0.005/-0.000	3.023	✓			
	3.163	+0.005/-0.000	3.164	✓			
	3.308	+0.005/-0.000	3.312	✓			
	3.429	+0.005/-0.000	3.330	✓			
	2.990	+0.005/-0.000	2.991	✓			
	2.618	+0.005/-0.000	2.623	✓		↓	
	0.200	+/-0.010	.200	✓		vern	CWC-08
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		"	
	4.971	+/-0.030	4.971	✓		vern	CWC-08
	124.100	+/-0.020	124.100	✓		tape	16-25

Measured by:	JLM
Date:	12/06/16

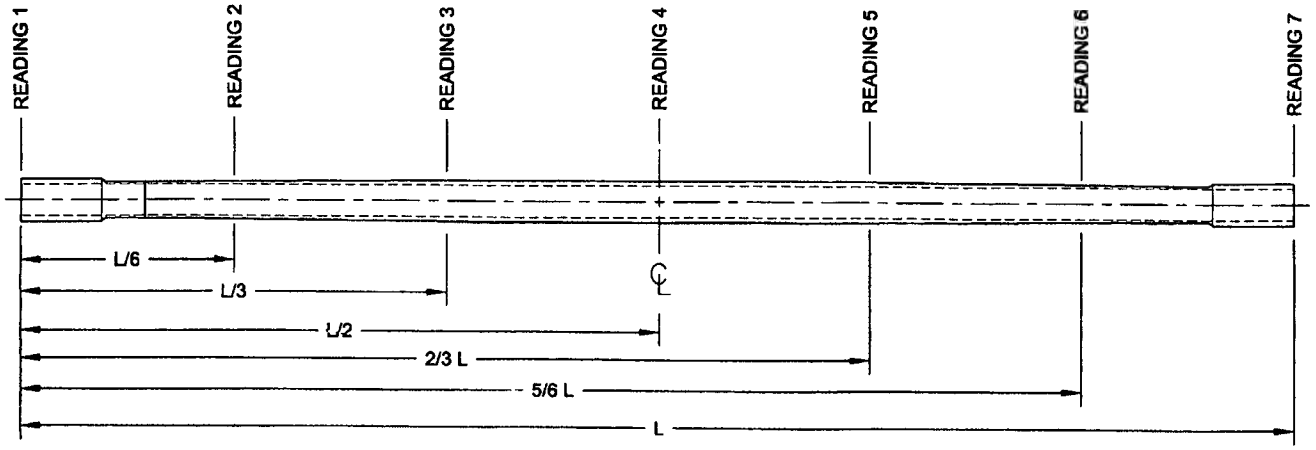
Audited by:	
Date:	12-6-18

Prototype Approval:	N/A
Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM	
D	10.02.02	Dimension 124.100 was 124.09	KJ	KJ

DART AEROSPACE LTD	Work Order:	85390
Description: Crosstube Assembly (412 High Aft)	Part Number:	D412-664-243
Inspection Dwg: D412-664-243 **Rev:** E		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN) w1	w2	w3	w4	Deviation Δw (max-min)	TOLERANCE
READING 1 L= 0"	.375	.377	.377	.364	.013	0.073"
READING 2 L= 20"	.304	.310	.321	.318	.017	
READING 3 L= 40"	.469	.475	.484	.480	.015	
READING 4 L=	CAN'T MEASURE, OK @ 12/6/18					
READING 5 L= 40"	.484	.480	.470	.479	.014	
READING 6 L= 20"	.318	.313	.305	.315	.013	
READING 7 L=	.367	.378	.370	.376	.010	

A

B

Calibration Result

Actual Block Thickness: 100-500

Sitescan 250 Measured Thickness: 100-500

Measured by:	KC	Audited by:		Preliminary Approval:	
Date:	12-6-20	Date:	12-6-18	Date:	

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM	
D	10.02.02	Dimension 124.100 was 124.09	KJ	
E	12.06.04	Wall thickness form added	KJ	

Item	Qty -243	Part Number	Description
1	X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D6009-129	CROSSTUBE
3	2	D3595-063-570	RUBBER CUSHION
4	1	D2896-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
6	2	D2856-600-1009	ABRASION STRIP
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO 85391 MLJ
12/06/07

② DEO ATTACHED

RELEASED
2009 -10- 29

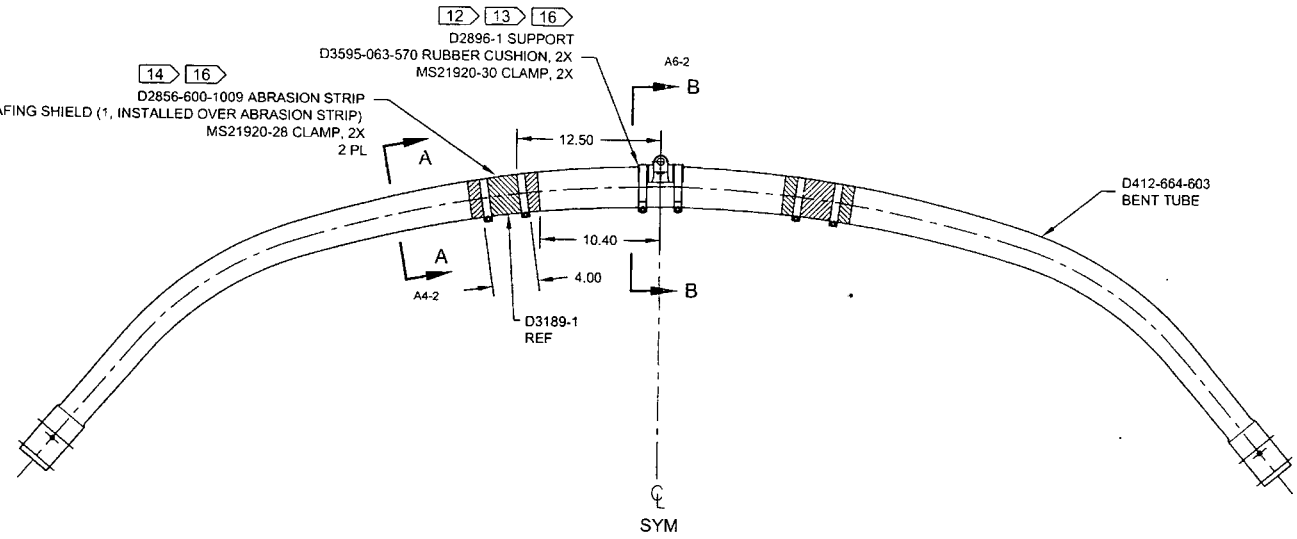
GENERAL NOTES:

1) MATERIAL: MANUFACTURED FROM D6009-129
   FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING/TRIMMING)
2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
   PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
   PAINT OUTSIDE PER DART QSI 005 4.2
3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
4) UNITS: INCHES UNLESS OTHERWISE NOTED.
5) BREAK SHARP EDGES: 0.005 TO 0 010 MAX.
6) IDENTIFICATION: SCRIBE DART PART NUMBER "D412-664-243" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
7) WEIGHT: 47.0 lbs (PER IIN-D212-664)
8) PART IS SYMMETRIC ABOUT CENTERLINE
9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
13) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE THE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035
15) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

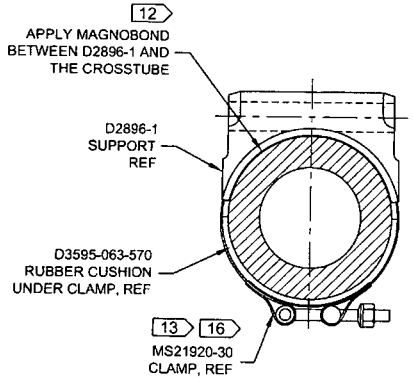
REV.	DESCRIPTION	BY	DATE
E	REFORMAT/REVISE GENERAL NOTES; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); ADD TOLERANCE (ZN B6-3, C4-3, C8-3 & C5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	09.09.30
D	REMOVE D2732-058, CHANGE TO D3595-063-570	PH	07.03.09
C	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398, MS21920-32 WAS MS21920-30	MB	06.10.27
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	01.10.17

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D412-664-243	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30		

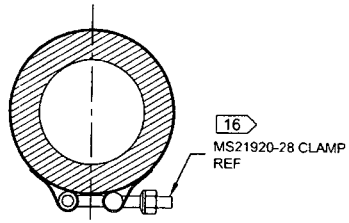
95391



D212-664-243
ASSEMBLY DETAIL E



SECTION B-B D4-2
SCALE 4X



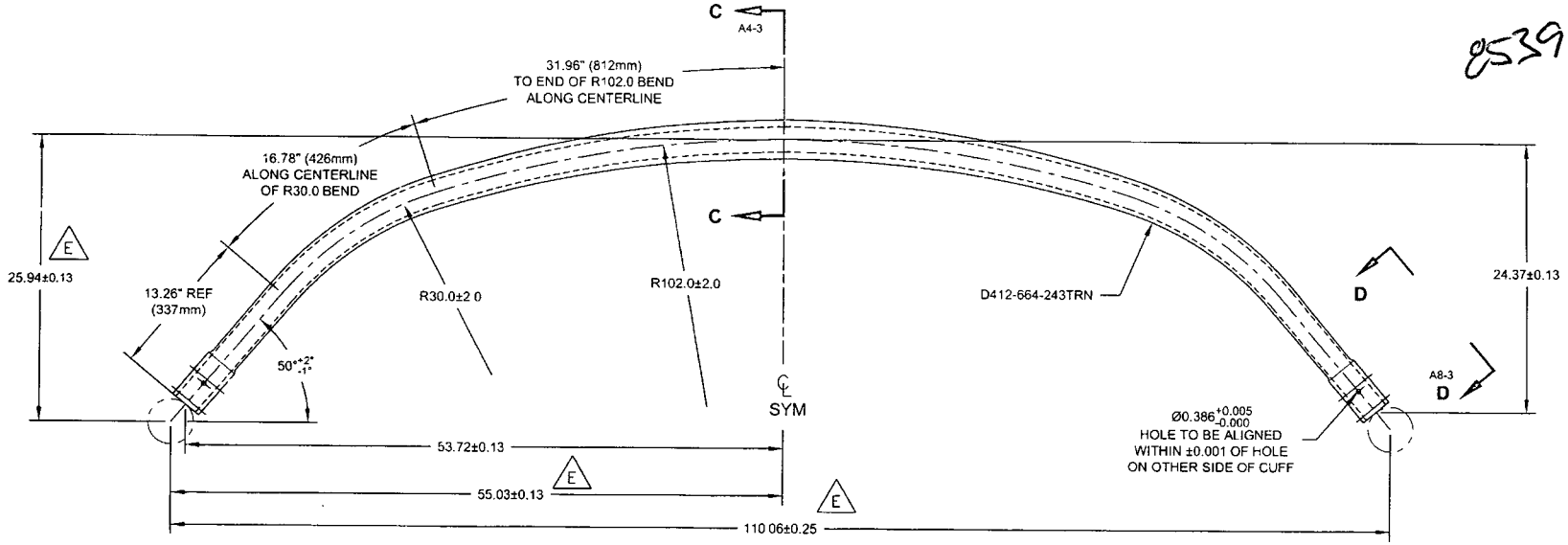
SECTION A-A C6-2
SCALE 4X

(2) DEO 15 ATTACHED

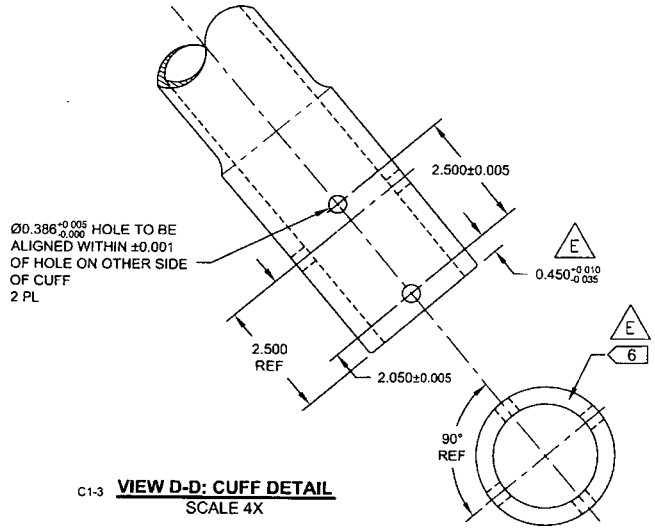
RELEASED
2009 -10- 28

DESIGN	AH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	
CHECKED		DRAWING NO. D412-664-243 REV. E SHEET 2 OF 4
MFG. APPR.		
APPROVED		TITLE CROSSTUBE ASSEMBLY (412 HI AFT) SCALE NTS
DE APPR.		
DATE 09.09.30		

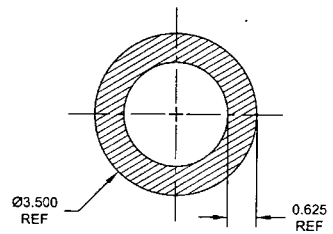
05391



D412-664-603 10
BENDING AND DRILLING DETAIL E



C1-3 **VIEW D-D: CUFF DETAIL**
SCALE 4X

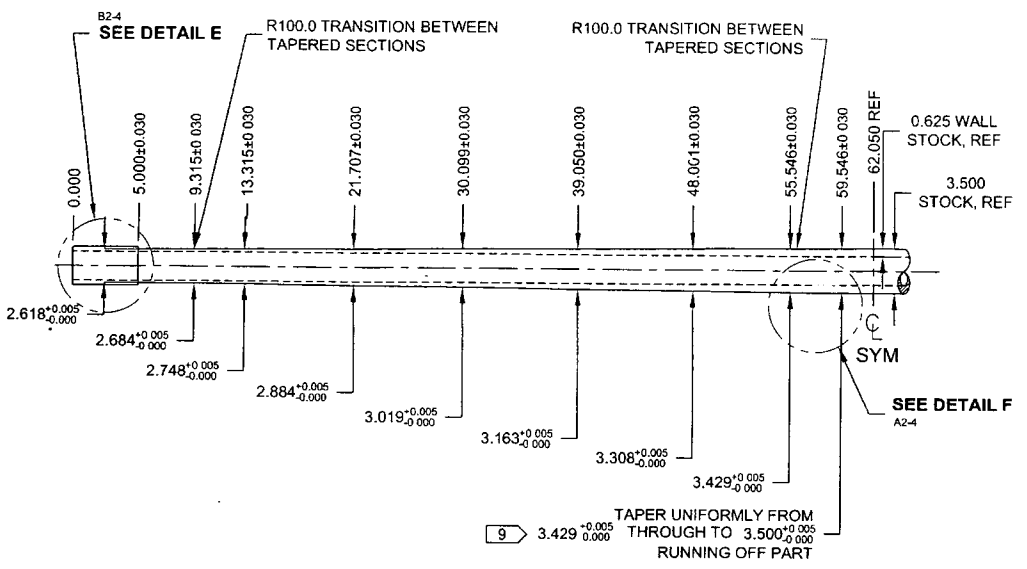


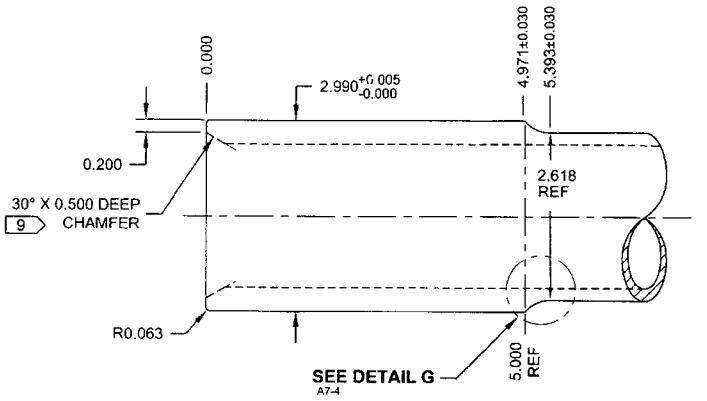
SECTION C-C D5-3
SCALE 4X

② DEO'S ATTACHED

RELEASED
2009-10-29
MP

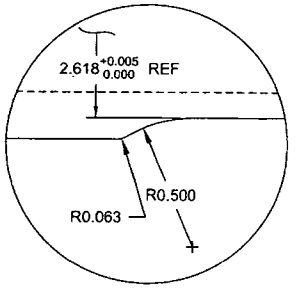
DESIGN	AH	**DART AEROSPACE LTD**	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D412-664-243	SHEET 3 OF 4
APPROVED	MP	TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	09.09.30		



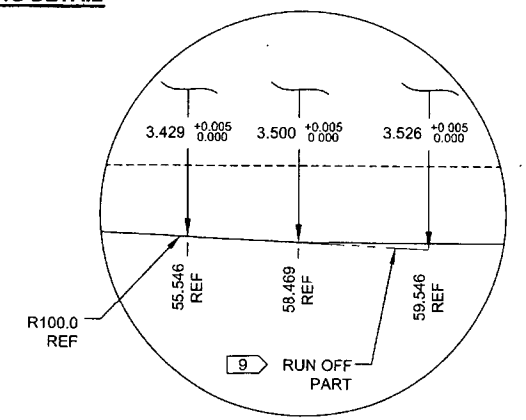


DETAIL E:
CROSSTUBE CUFF D8-4
SCALE 5X

D412-664-243TRN
TURNING DETAIL E



DETAIL G:
CUFF TRANSITION C2-4
SCALE 10X



DETAIL F:
TAPER RUN-OFF C4-4
NOT TO SCALE

DEO ATTACHED

RELEASED
2009 -10- 29

DESIGN	PH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	
CHECKED		DRAWING NO. REV. E
MFG. APPR.		D412-664-243 SHEET 4 OF 4
APPROVED		TITLE SCALE
DE APPR		CROSSTUBE ASSEMBLY (412 HI AFT) NTS
DATE	09.09.30	

DRAWING NO.	TITLE	REV. E	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO.	SHEET NO.	SCALE
D412-664-243	CROSSTUBE ASSEMBLY (412 HI AFT)			D412-664-243-E-1	SHEET 1 OF 2	NTS
DRAWN	CHECKED MP		MFG. APPR. E	APPROVED MP	DE APPR.	
DATE 11.03.31	DATE 11/03.31		DATE 11.03.31	DATE 11/03.31	DATE 11.03.31	

PURPOSE:
REMOVED ABRASION STRIP IN FAVOR OF A THIN LAYER OF PROSEAL 890.

05391

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

Item	Qty -243	Part Number	Description
6	0	D2856-600-1009	ABRASION STRIP

WAS:

6	2	D2856-600-1009	ABRASION STRIP

NOTES 2 AND 14, SHEET 1 ARE AMENDED AS FOLLOWS:

IS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, APPLY CLEAR COAT ON HATCHED AREA

14) APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEALED D3189-1 CHAFING SHIELD ONTO CROSSTUBE BY APPLYING A THIN COAT OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.

RELEASED
2011-04-07
MP

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

14) INSTALL D2856-600-1009 ABRASION STRIPS WITH A 0.13 REF GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.

DRAWING NO.	TITLE	REV.	DART AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D412-664-243	CROSSTUBE ASSEMBLY (412 HI AFT)	E	ENGINEERING ORDER	D412-664-243-E-1	SHEET 2 OF 2	NTS

DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.
DATE 11.03.31	DATE 11.03.31	DATE 11.03.31	DATE 11.03.31	DATE 11.03.31

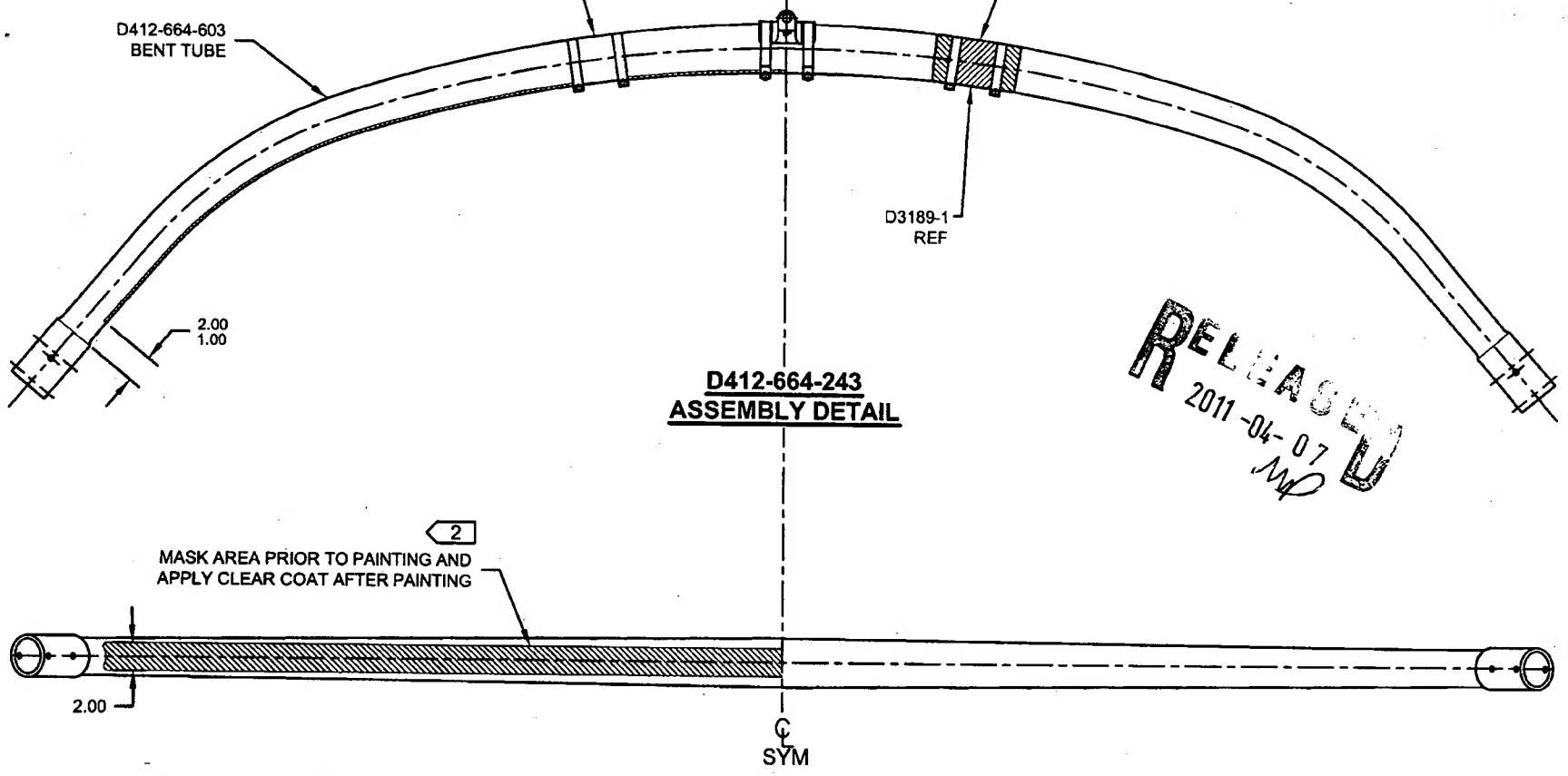
85391

IS:

16 14
D3189-1 CHAFING SHIELD (1, INSTALLED OVER PROSEAL 890)
MS21920-28 CLAMP, 2X
2 PL

WAS:

14 16
D2856-600-1009 ABRASION STRIP
D3189-1 CHAFING SHIELD (1, INSTALLED OVER ABRASION STRIP)
MS21920-28 CLAMP, 2X
2 PL



D412-664-243
ASSEMBLY DETAIL

RELEASED
2011-04-07

DRAWING NO.	TITLE	REV. E	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO.	SHEET NO.	SCALE
D412-664-243	CROSSTUBE ASS'Y (412 HI AFT)			D412-664-243-E-2	SHEET 1 OF 1	NTS

DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.
DATE 11.09.07	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19	DATE 11.09.19

85391

PURPOSE:
REPLACE MAGNOBOND WITH 3M DP460 SCOTCH-WELD EPOXY ADHESIVE

CHANGE:

IS:

Item	Qty -243	Part Number	Description
9	A/R	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 16, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

12) INSTALL D2896-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURED FOR 24 HOURS.**

WAS:

12) INSTALL D2896-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

16) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-09-29

EXTRUSION INSPECTION SHEET

TUBE #	TOTAL LENGTH	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Straightness at 12"	Rockwell Reading	ULTRA SONIC MEASURMENTS LOCATION on tube	R1	R2	R3	R4
1	129.00"	3.495"/3.492"	2.249"	0.612"/0.625"	0.019"	N/A	middle 64.5"	0.631"	0.631"	0.624"	0.624"
2	129.00"	3.500"/3.495"	2.249"	0.612"/0.641"	0.010"	N/A	middle 64.5"	0.630"	0.621"	0.625"	0.632"
3	129.00"	3.490"/3.498"	2.249"	0.615"/0.635"	0.005"	N/A	middle 64.5"	0.633"	0.638"	0.624"	0.618"
4	129.00"	3.491"/3.496"	2.248"	0.623"/0.632"	N/A	N/A	middle 64.5"	0.638"	0.630"	0.616"	0.625"
5	129.00"	3.498"/3.504"	2.250"	0.615"/0.621"	N/A	N/A	middle 64.5"	0.631"	0.624"	0.624"	0.630"
6	129.00"	3.493"/3.494"	2.249"	0.628"/0.612"	N/A	N/A	middle 64.5"	0.621"	0.623"	0.630"	0.623"
7	129.00"	3.491"/3.493"	2.250"	0.616"/0.630"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.627"	0.627"
8	129.00"	3.495"/3.495"	2.249"	0.625"/0.615"	N/A	N/A	middle 64.5"	0.624"	0.623"	0.627"	0.627"
9	129.00"	3.499"/3.498"	2.250"	0.633"/0.613"	0.008"	N/A	middle 64.5"	0.631"	0.641"	0.621"	0.620"
10	129.00"	3.495"/3.501"	2.251"	0.624"0.618"	N/A	N/A	middle 64.5"	0.619"	0.626"	0.636"	0.637"
11	129.00"	3.497"/3.500"	2.250"	0.625"/0.625"	N/A	N/A	middle 64.5"	0.621"	0.624"	0.632"	0.640"
12	129.00"	3.494"/3.498"	2.252"	0.615"/0.631"	N/A	N/A	middle 64.5"	0.625"	0.629"	0.629"	0.629"
13	129.00"	3.493"3.495"	2.251"	0.621"/0.615"	N/A	N/A	middle 64.5"	0.631"	0.626"	0.623"	0.628"
14	129.00"	3.491"/3.494"	2.250"	0.620"/0.618"	N/A	N/A	middle 64.5"	0.627"	0.621"	0.626"	0.642"
15	129.00"	3.493"/3.501"	2.246"	0.625"/0.628"	N/A	N/A	middle 64.5"	0.627"	0.630"	0.631"	06.26"

PART # D6009-129 | P/O# 14138 | BATCH # B69801 | Notes:

5/26/08